

ABSTRACT

A radio communications system (100) includes radio devices (10, 30), and antenna (11) and an array antenna (20). The radio devices (10 and 30) communicate a prescribed signal via the antenna (11) and the array antenna (20) in a system of transmission and reception at a single frequency, such as time division duplex (TDD), as the array antenna (20) changes the in directivity to form a plurality of directivities. The radio devices (10 and 30) detect a plurality of received radio waves' strength to produce receive signal profiles (RSSI1, RSSI2), respectively, indicating a plurality of strength profiles. The radio devices (10 and 30) multivalue strength of the receive signal profiles (RSSI1, RSSI2), respectively, and generate private keys (Ks1, Ks2) having the multivalued plurality of values serving as a bit pattern.